Tennessee Technological University

FOSTER HALL SANITARY SEWER MERCURY MONITORING PLAN

Background

The City of Cookeville, Tennessee is the holder of a National Pollution Discharge Elimination System (NPDES) permit issued by the Tennessee Department of Environment and Conservation (TDEC) under authorization from the US Environmental Protection Agency (USEPA). Prior to October 2010 the Cookeville, Water Quality Department had been working to locate a source of minute quantities of mercury observed at the treatment plant. Though observed outfall levels remain below permitted levels, these minute detections have contributed to Cookeville's exceedance of protection criteria associated with their pretreatment permit.

Cookeville's efforts to identify mercury contributions include samples collected on the Tennessee Technological University (TTU) campus on October 27, 2010 and November 3, 2010. These samples taken from a location just prior to the connection of TTU's system with the Cookeville sewer showed elevated mercury levels 0.63 µg/L and 0.21 µg/L, exceeding Cookeville's pretreatment protection criteria limit of 0.13 µg/L.

Cookeville Water Quality contacted TTU on November 8, 2010 to discuss the problem. TTU Campus Safety and Environmental Services Department agreed to undertake additional sampling to determine if a source could be located. Suspicions were that the source was Foster Hall the decades old chemistry and science building. TTU sampled at three different locations along the Foster Hall sewer trunk line. Positive results were observed at all locations which would indicate Foster Hall as the source. This was not surprising due to its historic use for chemistry instruction since a decade before the Environmental Protection Agency (EPA) existed.

Cookeville asked TTU to evaluate if a specific source could be located and remedied. TTU evaluated existing drain lines and "p-traps" at labs in Foster Hall without success. Contacts at other institutions of higher education indicated that mercury could collect at pipe seams because drain lines in 1960's era science buildings were regularly designed with Pyrex (glasslike) pipe. TTU became concerned that unnecessarily disturbing these lines could turn a discreet mercury source into a greater hazard.

In August 2011, TTU submitted these findings and concerns to the Cookeville Water Quality Department. Due to the fact that, subject to Tennessee Board of Regents (TBR) funding, the building is anticipated to be demolished prior to the end of 2020, and the City is able to meet effluent plant discharge limits, TTU requested leniency in exchange for increased system monitoring. This request was granted on November 23, 2011 with the caveats that the plan be reassessed and additional measures implemented in the event mercury levels at the plant begin to approach or exceed the City's mercury discharge limits.

Collection

Sample collection and analysis will be conducted by the TTU Center for Management, Utilization & Protection of Water Resources ("Water Center"). The Water Center is a premier resource within the field of water quality monitoring and analysis with clients in industry, government, and academe.

In January, April, July, and October the Water Center will collect grab samples at the manhole south of Foster Hall and the manhole near the southwest corner of Tucker Stadium (Figure 1). Samples will be collected in new sample bottles of a type indicated by the analyzing lab. Each location will use clean sampling equipment and materials. Samples will use standard labeling and Chain of Custody procedures to ensure sample integrity.

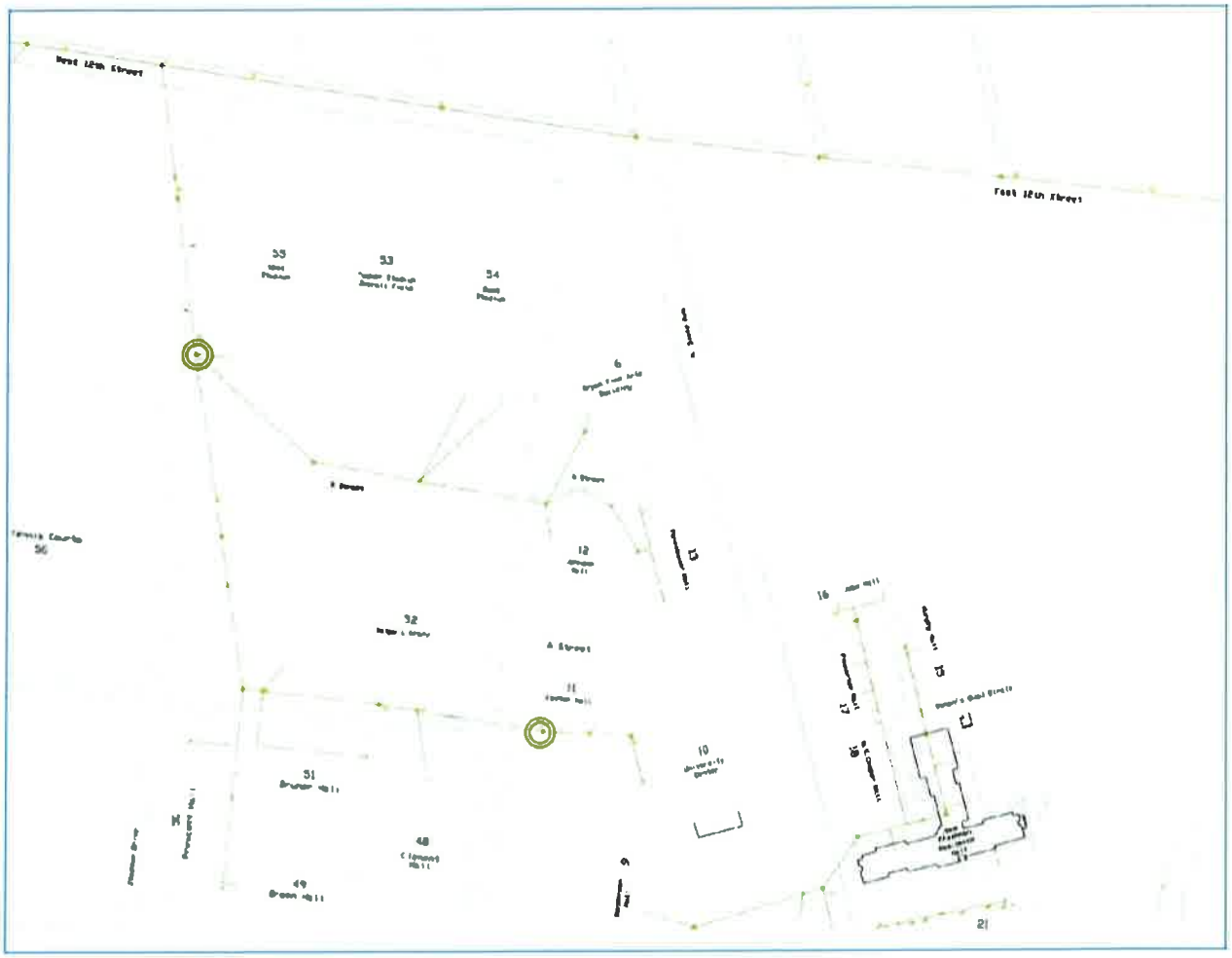

Figure 1- TTU Sanitary Sewer Sample Locations

Analysis

The Water Center uses the Perkin-Elmer Flow Injection Mercury System 100 (FIMS-100) consisting of a high sensitivity spectrometer with a high energy mercury source, precision long-path absorption cell and solar-blind detector, and a built-in flow injection system for mercury

analysis. Analysis for mercury will be performed using Manual Cold Vapor Atomic Absorption (EPA Method 245.1) or similar methods to achieve the same, or more precise, detection limits.

Currently, the City of Cookeville uses the EPA 245.1 methodology for compliance testing. The detection limit for this method (0.2.ug/L) will be adequate for analysis of TTU samples as long as the City can meet their effluent discharge limits.

Estimated Timeline

Underlying TTU's proposal, and Cookeville's leniency, is the fact that Foster Hall's rapidly approaching the end of its useful life. As identified in TTU's Master Plan, the Laboratory Sciences Building will house the current Foster Hall occupants and programs. The Laboratory Sciences Building project is currently in design. Construction is scheduled to begin in December 2017, with completion slated for February 2019. The building will be occupied and ready for use in June 2019. After Chemistry vacates Foster Hall, the Biology department will relocate to Foster Hall temporarily while Pennebaker Hall is renovated. The renovation is expected to take 18 – 24 months.

Tentative Timeline

- December 2017 – construction begins on Lab Sciences Building
- October 2018 – begin design of Pennebaker renovation
- February 2019 - Lab Sciences Building complete
- March 2019 – Lab Sciences Building equipment installation begins
- May 2019 – Chemistry moves to Lab Sciences Building
- Summer 2019 – Biology moves to Foster Hall
- October 2019 – Pennebaker renovation begins
- April 2021 – Pennebaker renovation complete
- May 2021 – Biology moves to Pennebaker Hall
- August 2021 – Discontinue programmatic use of Foster Hall
- January 2022- Begin remediation/ demolition of Foster Hall

In the event that TTU reaches July 2018 without a firm start date for design of the Pennebaker renovation, TTU will work with the City of Cookeville to determine whether remediation activities need to take place prior to the anticipated decommissioning of Foster Hall or if an extension to the current agreement may be issued.

Escalated Action Plan

In the event that mercury levels violate Cookeville's sludge application limits or effluent limits, TTU will be contacted to implement ways to reduce or prevent mercury from entering the sewer system. Two plans currently being considered would be cleaning/ jetting of drain lines or

collection and pretreatment of laboratory waste water. Because the risk of transforming a discreet source into a significant source exists, any methods would be approved by the City prior to initiating any remedial activities.

Reporting

Quarterly reports will be submitted to "Cookeville Water Quality Control, Attn: Pretreatment Coordinator" by fax (931-520-5376) or mail at 1860 S. Jefferson Avenue, Cookeville, TN 38506. In addition to analytical results for sample analysis, Tennessee Tech will supply a signed narrative acknowledging receipt of the quarterly sample data and an indication of awareness of the mercury levels discharged to the City sanitary sewer system. These reports will be kept on file for a minimum of three years.

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Vice President for Business and Finance

11/17/16
Date

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11/21/16
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Jim Cobb
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